

What is Claimed is:

1. A lipoprotein compound delivery particle, comprising:
 - (a) from 0.1 to 90 percent by weight of a lipophilic or amphipathic compound to be delivered;
 - 5 (b) from 0 to 50 percent by weight of at least one polar lipid in an amount sufficient to form a particle with said lipophilic compound
 - (c) from 0 to 90 percent by weight of at least one neutral lipid; and
 - (d) from .5 to 90 percent by weight of a truncated apolipoprotein B protein in said particle having a deleted LDL receptor binding region.
- 10 2. The particle according to claim 1, wherein said apolipoprotein B further comprises a fused heterologous moiety, where said heterologous moiety is a member of a specific binding pair.
- 15 3. The particle according to claim 2, wherein said heterologous moiety is a peptide.
- 20 4. The particle according to claim 2, wherein said heterologous moiety is an antibody.
- 25 5. The particle according to claim 2, wherein said heterologous moiety is a single chain antibody.
6. The particle according to claim 2, wherein said heterologous moiety is a single chain anti HER2 antibody.
- 30 7. The particle according to claim 1, wherein said particle has a diameter less than 18 nanometers.
8. The particle according to claim 1, wherein said particle has a diameter of from 5 to 5,000 nanometers.

9. The particle according to claim 1, wherein said said apolipoprotein B is selected from the group consisting of through apoB74.

5 10. The particle according to claim 1, wherein said particle has a neutral core, and wherein said ApoB comprises at least ApoB 19.5.

11. The particle according to claim 1, wherein said apolipoprotein B is mature Apo B.

10 12. The particle according to claim 1, wherein said apolipoprotein B is mammalian Apo B.

15 13. The particle according to claim 1, wherein said apolipoprotein B is human Apo B.

14. The particle according to claim 1, wherein said at least one polar lipid is a phosphatidylcholine, phosphatidylethanolamine, phosphatidylserine, phosphatidylinositol, sphingomyelin, glycosphingolipid, lysolipid thereof, or combinations thereof.

20 25 15. The particle according to claim 1, wherein wherein said at least one neutral lipid comprises a triglyceride, cholesterol, derivative thereof, or combination thereof.

16. The particle according to claim 1, wherein said compound to be delivered is paclitaxel.

30 17. The particle according to claim 1, comprising:

- (a) from 0.1 to 50 percent by weight of said compound to be delivered;
- (b) from 10 to 50 percent by weight of said at least one polar lipid;
- (c) from 0 to 10 percent by weight of at least one neutral lipid; and

(d) from 50 to 90 percent by weight of said truncated apoB.

18. The particle according to claim 17, wherein said particle is a discoidal particle.

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19. The particle according to claim 1, comprising:

(a) from 0.1 to 55 percent by weight of said compound to be delivered;

(b) from 15 to 55 percent by weight of said at least one polar lipid;

(c) from 2 to 30 percent by weight of at said least one neutral lipid; and

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(d) from 30 to 80 percent by weight of said truncated apoB.

20. The particle according to claim 19, wherein said particle is a small emulsion particle.

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21. The particle according to claim 19, comprising:

(a) from 0.1 to 80 percent by weight of said compound to be delivered;

(b) from 1 to 30 percent by weight of said at least one polar lipid;

(c) from 30 to 90 percent by weight of at said least one neutral lipid; and

(d) from .5 to 10 percent by weight of said truncated apoB.

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22. The particle according to claim 21, wherein said particle is a large emulsion particle.

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23. The particle according to claim 21, wherein said compound to be delivered is an amphipathic compound, and wherein said amphipathic compound comprises a synthetic lipid.

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24. A pharmaceutical formulation comprising a plurality of lipoprotein compound delivery particles of claim 1.

25. The pharmaceutical formulation of claim 24, consisting essentially of said particles in a size of 2 to 20 nanometers in diameter.

26. The pharmaceutical formulation of claim 24, consisting essentially of particles
5 in a size of 5 to 40 nanometers in diameter.

27. The pharmaceutical formulation of claim 24, consisting essentially of particles
in a size of 10 to 60 nanometers in diameter.

10 28. The pharmaceutical formulation of claim 24, consisting essentially of particles
in a size of 15 to 100 nanometers in diameter.

29. The pharmaceutical formulation of claim 24, consisting essentially of particles
in a size of 25 to 200 nanometers in diameter.

15 30. The pharmaceutical formulation of claim 24, consisting essentially of particles
in a size of 50 to 1,000 nanometers in diameter.

31. The pharmaceutical formulation of claim 24, consisting essentially of particles
20 in a size of 250 to 5,000 nanometers in diameter.

32. The pharmaceutical formulation of claim 24, in a pharmaceutically acceptable
carrier.

25 33. The pharmaceutical formulation of claim 32, wherein said carrier is an
aqueous carrier.

34. The pharmaceutical formulation of claim 24, in sterile lyophilized form.

35. A method of delivering a compound to a subject in need thereof, comprising administering a lipoprotein compound delivery particle of claim 1 to said subject in an amount effective to deliver said compound to said subject.

5 36. The method according to claim 35, wherein said administering step is carried out by parenteral injection.

37. The method according to claim 35, wherein said administering step is carried out by intravenous injection.

10 38. The method according to claim 35, wherein said administering step is a topical administration step.

39. A covalent conjugate, comprising:

15 (a) a truncated apolipoprotein B protein in having a deleted LDL receptor binding region; covalently coupled to
(b) a heterologous moiety, where said heterologous moiety is a member of a specific binding pair.

20 40. The compound according to claim 39, wherein said conjugate is a fusion protein.

41. The compound according to claim 39, wherein said truncated apolipoprotein B is selected from the group consisting of apoB6 through apoB74.

25 42. The compound according to claim 39, wherein said heterologous moiety is a receptor binding group.

30 43. The compound according to claim 39, wherein said compound is an apoB23 anti-HER2 single-chain antibody fusion protein.

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